

September 2013

## The Road to Reform

---

Prepared by  
 Mark Zandi  
[Mark.Zandi@moodys.com](mailto:Mark.Zandi@moodys.com)  
 Chief Economist

Cristian deRitis  
[Cristian.deRitis@moodys.com](mailto:Cristian.deRitis@moodys.com)  
 Senior Director - Consumer Credit  
 Analytics

---

### Contact Us

Email  
[help@economy.com](mailto:help@economy.com)

U.S./Canada  
 +1.866.275.3266

EMEA (London)  
 +44.20.7772.5454  
 (Prague)  
 +420.224.222.929

Asia/Pacific  
 +852.3551.3077

All Others  
 +1.610.235.5299

Web  
[www.economy.com](http://www.economy.com)

---

Debate is heating up over the future of the nation's housing finance system. Much of the back and forth has focused on the system's end state—whether housing finance should be privatized, retain some form of government backstop, or even remain effectively nationalized as it is today. No matter which goal is chosen, however, reform will not succeed without an effective transition. A clearly articulated plan for getting from here to there is vital; otherwise policymakers will be appropriately reluctant to move down the reform path. This paper presents a clear road map to the new housing finance system.<sup>1</sup>

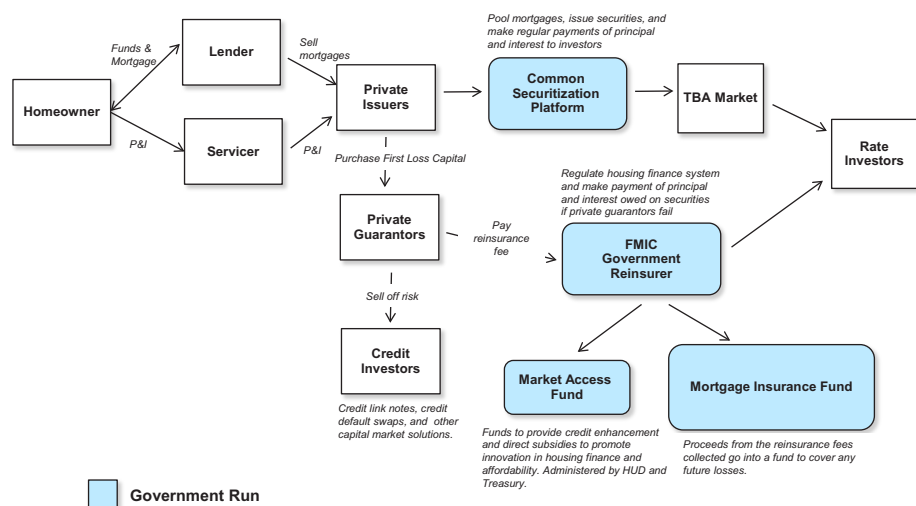
For this paper, it is assumed that the future housing finance system will be a hybrid system. That is, private capital will be responsible for losses related to mortgage defaults, but in times of financial crisis, when private capital is insufficient to absorb those losses, the government will step in. Mortgage borrowers who benefit from the government backstop will pay a fee to compensate the government for potential losses. Under most proposals, between a third and half of all mortgage loans will be covered by this catastrophic government backstop.

While there are advantages and disadvantages to any housing finance system, a hybrid system is the most likely to be implemented. Such a system will preserve the long-term fixed-rate mortgage as a mainstay of U.S. housing, and it will ensure that affordable mortgage loans are available to most middle-income Americans through good and bad times. Taxpayers will backstop the system, but it will be designed so that lenders and borrowers bear the ultimate cost. A hybrid housing finance system has the broadest political backing: Senators Bob Corker (R-TN) and Mark Warner (D-VA) recently introduced legislation to establish a hybrid system, and President Obama has expressed support.<sup>2</sup>

A hybrid system will require substantial new private capital. Currently, little private capital is involved in making mortgage loans; the federal government via Fannie Mae, Freddie Mac, and the Federal Housing Administration acts as the nation's principal mortgage originator.<sup>3</sup> How much private capital will be needed depends on many factors, but assuming the new system's requirements are consistent with those applied to the nation's largest banks, as much as \$175 billion in today's dollars might have to be raised. For context, this amounts to more than the equity raised in the 10 largest initial public offerings in U.S. history combined, including those for the insurer AIG and the credit-card giant Visa. Such a large amount will not be easy to raise quickly. Any viable transition plan must therefore clearly determine where the private capital will come from and at what cost.

The transition plan must also spell out the fate of Fannie Mae and Freddie Mac. While few wish to return to the old system, which was dominated by these thinly capitalized, too-big-to-fail behemoths, the consensus stops there. Some insist that Fannie and Freddie be completely dismantled, while others propose using their current profits to recapitalize and ultimately reprivatize them. Dismantling the two institutions would risk disrupting the flow of mortgage credit, which, for all their faults, Fannie and Freddie continued to provide efficiently through the Great Recession and subsequent recovery. On the other hand, recapitalizing and privatizing the institutions could leave them in control of U.S. housing finance. It is un-

**Chart 1: Future Housing Finance System**



clear who could compete with them; without such competition, the future system will eventually resemble the old one. A dominant duopoly will be able to overcharge for their services and will become the taxpayers' problem if they blunder again.

A host of smaller but still critical technical and legal issues must also be resolved in the transition to a new system. Moving Fannie and Freddie from their current conservatorship status to receivership to new ownership will be complicated. Their mortgage securities must be managed by whoever succeeds them at least as efficiently as they are doing. Shifting oversight authority from the Federal Housing Finance Agency, Fannie's and Freddie's current regulator, to the overseer of the future system will also involve many steps. And ensuring that small lenders have access to the government backstop for the mortgages they originate will not be easy.

Some initiatives necessary to reshape the housing finance system are already under way and should be nurtured. The FHFA is developing a common securitization platform, which will be important no matter the system's final form. The platform should support greater transparency, which in turn will promote better credit risk management and lower future mortgage defaults, more liquidity, better access for small lenders and increased competition. The FHFA is also

requiring Fannie and Freddie to share more risk with private investors, including private mortgage insurers and investors. This should provide information and experience necessary for the risk-sharing envisaged under most housing finance reform proposals.

The transition will require legislation and take years to implement, but given the current political environment, the most likely scenario is gridlock. Despite compelling economic arguments for action, there are lower than even odds that Congress will come together any time soon around a reform plan. A clearly laid-out road to reform could help raise these odds, however. With such a road map, it is plausible that housing finance reform could become law soon after the 2014 midterm elections. The transition would likely begin in 2016 and the bulk of it completed five years later. It is exciting to think that the new housing finance system could conceivably be in place at the start of the next decade.

**The end state**

While the debate over the future housing finance system is far from settled, it is assumed here that policymakers will ultimately adopt a hybrid system. Knowing where the system is headed is necessary for laying out a clear transition process.

In the future hybrid system, private investors provide the capital supporting the

system, but there is a government backstop in case of a catastrophic financial crisis (see Chart 1).<sup>3</sup> That is, under most circumstances, private investors shoulder losses when mortgages default. But during rare, catastrophic situations such as the Great Recession, when mortgage losses wipe out private capital, the government ensures that mortgage lending is uninterrupted.

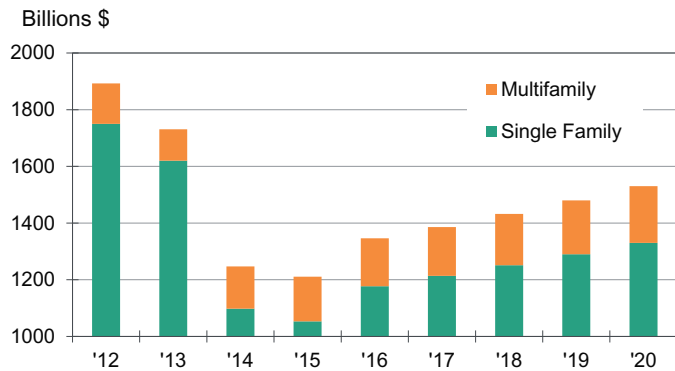
To be eligible for the government's catastrophic guarantee, mortgage-backed securities must include only high-quality mortgage loans, and substantial private capital must be able to take losses before the guarantee kicks in.<sup>4</sup> To ensure that the private institutions and investors follow the rules, a government regulator—call it the Federal Mortgage Insurance Corporation—oversees the housing finance system. The FMIC also maintains an insurance fund—the Mortgage Insurance Fund—to cover any losses the government may incur in a catastrophic situation. The FMIC charges a guarantee fee, or g-fee, to fund the MIF and oversee the housing finance system.<sup>5</sup>

To obtain the government guarantee, mortgage-backed securities must also use a common, government-run securitization platform. This would leverage current efforts by the FHFA to develop a single platform for Fannie Mae and Freddie Mac securities.<sup>6</sup> A common platform would standardize securitization, create significant economies of scale, and provide a more liquid market for MBS, benefiting both private investors and homeowners.

As in the current system, mortgage originators, servicers and MBS issuers could be affiliated with each other. A new addition would be private MBS guarantors: monoline companies, backed neither explicitly nor implicitly by the government and prohibited from being owned by originators or issuers. These guarantors would be required to maintain capital and liquidity similar to major banks. They would purchase catastrophic insurance from the government, so that the government would repay MBS investors if the guarantors became insolvent. The guarantors themselves could fail, however.

The envisaged hybrid system would be resilient to financial and economic crises and

**Chart 2: Mortgage Origination Outlook**



Sources: MBA, Moody's Analytics

would mitigate the impact if crises did occur. The system would also provide access to desirable mortgage products such as long-term, fixed-rate loans for creditworthy borrowers. And it would be designed to allow small mortgage lenders easy access to the government guarantee and promote affordable single-family and rental housing, since qualifying multifamily mortgages would also be eligible for the government guarantee.<sup>7</sup>

**Transition objectives**

The transition from the current, largely nationalized, housing finance system to the future hybrid system must meet five principal objectives:

- » *Protect the economic recovery.* Government support to the housing finance system cannot be withdrawn too quickly without undermining the housing recovery, which is vital to the broader economic recovery. Mortgage credit conditions are still very tight: Lenders remember the massive losses suffered during the housing crash and are uncertain about a number of regulatory issues. Prematurely withdrawing government support would exacerbate this problem.
- » *Repay taxpayers.* Taxpayers should be made financially whole. The government's support to Fannie and Freddie should be repaid, along with some of the costs of backstopping the rest of the housing market after Fannie and Freddie failed, and the costs associated with setting up a new financial

obligations of Fannie and Freddie through agreements between the Treasury Department and the two firms. This must continue through the transition period. Not doing so would undermine investors' faith in the U.S., raising borrowing costs and exacerbating the nation's fiscal problems. This is a legacy of the old system, and while the new system should avoid re-creating this obligation, we cannot retroactively change expectations without damaging the nation's credibility in global credit markets.

- » *Ensure more and varied sources of private capital.* Private capital standing in front of the government's guarantee must be adequate to absorb mortgage losses resulting from all but the most severe financial crises and economic downturns. This is necessary to protect the government against losses and avoid future bailouts. A substantial amount of private capital, from varied sources, will be needed by the future housing finance system.
- » *Eliminate too-big-to-fail.* The transition to the new housing finance system must reduce the system's reliance on large and complex financial institutions such as Fannie Mae and Freddie Mac. The housing finance system's design must ensure that institutions in the system can fail without catastrophic economic consequences.

system. Taxpayers should also receive a return on their financial support commensurate with the risks they took.

» *Protect holders of legacy Fannie and Freddie MBS and debt securities.* The federal government now guarantees existing MBS and bond

» *Promote affordability.* Access to affordable owner-occupied and rental housing must be maintained through the transition. This has become even more important in the wake of the Great Depression and the significant destruction of homeowners' equity in the Great Recession, ongoing financial pressure on low-income households, and changing demographics.

**How much capital?**

The future hybrid finance system's capital requirements depend on a range of factors, including mortgage origination volume, the share of originations receiving the government guarantee, and the amount of private capital needed to stand in front of the guarantee. Based on the assumptions described below, the system will require \$123 billion in new capital by 2020, and \$175 billion over the long run (in today's dollars).

**Origination volume**

In 2016, the year the transition to the new hybrid housing finance system begins, single-family mortgage originations are expected to total nearly \$1.2 trillion, a significant drop from recent years because of lower anticipated refinancing activity.<sup>8</sup> The average coupon on outstanding mortgages is currently close to 5%. With mortgage rates expected to average 6.5% by 2016, most homeowners with mortgages will have little reason to refinance.<sup>9</sup>

Partially offsetting the drop in refis will be stronger originations for home purchases. This will be fueled by rising home sales and prices and a greater demand for mortgages as investor demand wanes and first-time and trade-up buyers become more active.<sup>10</sup> Purchase volumes will be dampened somewhat by lower loan-to-value ratios; these are currently high because of the loss of equity during the housing crash and the high share of low down payment FHA lending. LTVs are expected to decline modestly through the end of the decade as homeowners' equity is rebuilt and FHA lending recedes.

Single-family mortgage originations are expected to rise approximately 3% per year

between 2016 and 2020, reaching \$1.4 trillion (see Chart 2). This is consistent with expected long-run house price growth, as the other factors affecting origination volumes will largely offset each other.

Multifamily mortgage originations are expected to total \$170 billion in 2016. This would be a record, produced as the multifamily market benefits from a further modest decline in the homeownership rate. Foreclosures will remain elevated through 2016 as the last of the problem single-family loans made during the housing boom are resolved. Between 2016 and 2020, multifamily originations are expected to grow 4% per year to \$200 billion. Strong demand during this period for apartments from an expanding cohort of people between ages 25 and 34—the principal source of apartment demand—is expected to support stronger growth in rents and multifamily property prices.

### Guarantee share

The share of single-family mortgage originations that qualify for a government guarantee will largely be determined by policymakers. A key policy lever affecting the share is the limit on conforming loans. Currently, Fannie and Freddie loans are capped at \$625,000 in high-cost areas and \$417,000 everywhere else. Assuming policymakers set the loan limit at \$417,000 across the country, based on the distribution of loans currently backed by Fannie and Freddie, just under 40% of originations would be eligible for the guarantee. It is thus assumed that the share of single-family mortgage loans receiving the catastrophic government guarantee in the hybrid system will decline steadily, from approximately 65% now to 40% by 2020.

The conforming loan limit will determine the guarantee share, because government-guaranteed loans will be favored by mortgage originators. Other alternatives, such as holding loans on originators' balance sheet or securitizing them in the private-label market will be more costly. Based on current pricing for Fannie Mae MBS, the marginal cost of funding for government-guaranteed securities in the hybrid system will be approximately 50 basis points.<sup>11</sup> This compares

with well over 100 basis points for bank funding via senior unsecured debt and closer to 150 basis points for private-label MBS.

The difference in marginal funding cost will be much greater in stressed economic periods. During the worst of the Great Recession, the marginal cost of bank funding soared, and the private-label market shut down.

The share of multifamily mortgages with the government guarantee will also be determined by regulatory eligibility limits. These are assumed to remain close to Fannie's and Freddie's current 40% share of originations. The government guarantee is important to ensuring the flow of multifamily mortgage credit during difficult economic periods and to rental developments catering to lower-income households, as well as those in rural and smaller urban areas.

### Private first-loss capital

The amount of private capital required to stand in front of the government's guarantee is also a matter of substantial debate, although there is general agreement that it should be greater than it was before the Great Recession. Prior to the downturn, Fannie and Freddie had enough capital to withstand a loss rate of only about 1%. This was clearly insufficient, as the institutions ended up in conservatorship, effectively nationalizing the housing finance system.

In the Corker-Warner hybrid system, private financial institutions are required to have enough capital to withstand a 10% loss before the government steps in.<sup>12</sup> This is an extraordinarily high loss rate, which would occur only in an almost inconceivable financial calamity.

There are benefits to such a high level of capitalization. It would provide a fortress financial foundation for the housing finance system, eliminating taxpayers' exposure to risk and allaying concerns about the government charging too little for its guarantee.<sup>13</sup> It should also dispel moral hazard concerns that private financial institutions could lower their underwriting standards and take on too much risk thinking they would be bailed out by the government. Private capital would have lots of skin in the game.

But the cost of such a high capitalization rate is substantial, as mortgage rates would be significantly higher, especially for borrowers with less than pristine credit and particularly in times of economic stress. It would also misallocate hundreds of billions of dollars in capital that could be used more productively elsewhere.

A good benchmark for the amount of private capital backing housing finance is the amount of losses suffered in the Great Recession. This was the proverbial hundred-year flood. Fannie, Freddie, and the private mortgage insurers will ultimately have a combined loss rate of less than 5% resulting from the recession (see Table 1).<sup>14</sup> This would be a conservative capitalization rate, since in the future system, regulation would demand that guaranteed mortgages be of higher quality than those purchased by Fannie and Freddie before the recession.

Private capitalization of 5% would also be consistent with the amount of capital the nation's largest banks are required to hold under Basel III and the Dodd-Frank Act. To be well-capitalized, systemically important banks will likely need to maintain a 10% Tier 1 common equity ratio. With mortgages receiving a 50% average risk weighting, the guarantors in the hybrid system would need to hold 5% capital.

The level of private capitalization has a significant impact on mortgage rates: The higher the level required, the more guarantors in the future hybrid system will need to charge in guarantee fees. At a 1% capitalization rate, guarantors would need to charge 20 basis points, about what Fannie and Freddie charged before the recession.<sup>15</sup> At a 5% capitalization rate, the fee would be close to 70 basis points, and at 10%, the fee would be almost 140 basis points. For context, Fannie's current average guarantee fee is 57 basis points, consistent with an approximately 4% capitalization rate. Every 10-basis point increase in g-fees adds about \$15 to the monthly cost of a typical mortgage.

### Required capital

Based on the origination outlook and the expected guarantor share, the amount of mortgage debt receiving a government guar-

**Table 1: Residential Mortgage Loan Realized Losses**

\$ bil

	2006	2007	2008	2009	2010	2011	2012	Total 2006-2012	Debt Outstanding Yr-end 2007	Losses as a % of Debt
<b>Total</b>	17.1	38.5	136.5	216.1	190.0	161.8	159.9	919.9	11,207	8.2
<b>Government-Backed</b>	7.1	7.7	17.9	31.8	51.4	46.3	44.2	206.4		
Fannie Mae & Freddie Mac	0.8	1.8	10.3	21.3	37.3	31.4	26.0	128.9	4,820	2.7
Fannie Mae	0.6	1.3	6.5	13.4	23.1	18.3	14.4	77.6		
Freddie Mac	0.2	0.5	3.8	7.9	14.2	13.1	11.6	51.3		
Federal Housing Administration	6.3	5.9	7.6	10.5	14.1	14.9	18.2	77.5	449	17.3
<b>Privately Backed</b>	10.0	30.8	118.6	184.3	138.6	115.5	115.7	713.5		
Mortgage insurers	1.5	6.9	10.8	9.6	6.6	6.0	6.0	47.4		
Depository Institutions	2.7	7.3	35.0	54.9	48.2	35.3	33.3	216.7	3,729	5.8
Private-Label Mortgage Securities	5.8	16.6	72.8	119.8	83.8	74.2	76.4	449.4	2,209	20.3
Subprime	5.6	15.5	55.9	71.6	39.0	34.7	35.5	257.8		
Alt-A	0.2	0.9	11.3	28.0	24.0	20.5	20.1	105.0		
Option ARMs	0.0	0.2	5.2	17.9	17.4	14.8	16.5	71.9		
Jumbo	0.0	0.0	0.4	2.3	3.4	4.1	4.3	14.6		
Note: Securitized HELOC	0.2	1.5	5.1	5.1	3.4	2.1	1.6	18.9		

Sources: Fannie Mae, Freddie Mac, HUD, FDIC, Federal Reserve Board, Moody's Analytics

antee will increase from approximately \$800 billion in 2016 to \$3.1 trillion in 2020.<sup>16</sup> With a 5% capital requirement, the amount of private capital needed in the future housing finance system would rise from approximately \$37 billion in 2016 to \$123 billion in 2020 (in today's dollars). Over the long run, after the guarantors' single-family and multifamily books of business have settled into their 40% shares, close to \$175 billion in private first-loss capital (in today's dollars) will be needed to support the housing finance system (see Chart 3).

**Sources of capital**

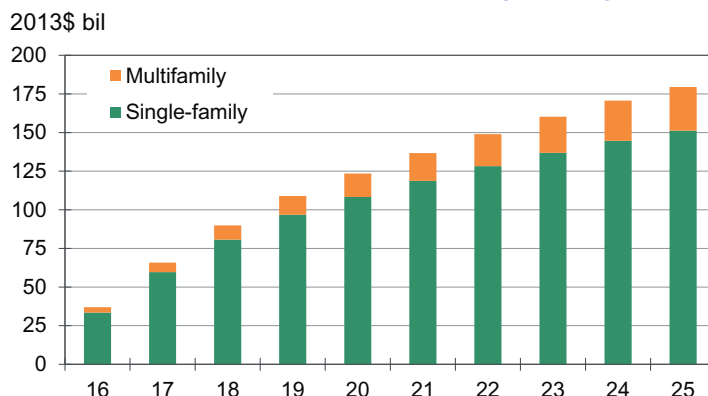
A substantial amount of private capital will thus be necessary to support the future housing finance system. Over time, some will come through the guarantors' retained earnings. This will not help in the early years, but under conservative assumptions, retained earnings could provide as much as one-third of the guarantors' capital requirements by 2020. By then the guarantors' earning power should be strong enough to make them

roughly self-capitalizing. Yet this will not help produce the capital needed when the new system begins operating in 2016, or the roughly \$85 billion in capital still needed in 2020 (\$123 billion in total capital needs less \$38 billion in estimated retained earnings).

The equity market is a potential source for early capital. Some financial institutions have held big initial public offerings in the recent past: AIG, Visa, and Bank of America each raised close to \$20 billion in equity. The guarantors in the future housing finance system should have a similar return on equity as the money-center banks and life insurers of about 10%. This would be

consistent with a valuation of 100% of tangible book value and a price-earnings multiple of 10. The guarantors' return on equity would be less than the 15% ROE that private mortgage insurers have historically received, although this appears to have declined closer to 12% in the current low-interest rate environment. It is encouraging that many private mortgage insurers have

**Chart 3: Private Capital Needs in Hybrid System**



Source: Moody's Analytics



**Table 2: Private Mortgage Insurers' Top 10 Shareholders**

Mar 31, 2013

MGIC		Radian		Genworth	
Shareholder	%	Shareholder	%	Shareholder	%
Maverick Capital	6.98	Fidelity Management	9.33	Dodge & Cox	7.19
Paulson & Co.	5.03	Paulson & Co.	6.65	The Vanguard Group	6.02
The Vanguard Group	5.02	BlackRock Trust	5.25	Fidelity Management	5.62
BlackRock Trust	4.41	The Vanguard Group	5.16	BlackRock Trust	4.03
Blue Ridge Capital	4.41	Dimensional Fund	5.12	State Street Global	3.94
Old Republic	4.01	Rima Senvest	5.05	Legg Mason Capital	2.78
Dimensional Fund	3.68	T. Rowe Price	4.12	Highfields Capital	2.67
SAB Capital	3.63	Morgan Stanley	2.05	Paulson & Co.	1.83
Fidelity Management	3.48	State Street Global	1.76	ESL Investment	1.70
Perry Capital	2.65	Columbia Management	1.71	Gosha Trading	1.40

Sources: Companies, Moody's Analytics

been able to raise significant equity capital in recent months.

But it is hard to see the equity market producing the entire \$85 billion in additional capital needed by the guarantors by 2020. Equity investors will be rightly nervous about the new system, and will question the guarantors' earnings prospects in a highly regulated and mature market. The guarantors' earnings may also be relatively volatile, fluctuating with the housing and business cycles, and their market share will shift against the nonguaranteed part of the mortgage finance system. And of course there is the reputational risk associated with playing a pivotal role in the provision of mortgage credit.

Nonetheless, it is reasonable to expect the equity market to comfortably provide \$50 billion in capital over a five-year period. In one plausible scenario, three guarantors would go public in 2016, the first year of the hybrid system, raising a total of \$24 billion. Two additional IPOs in 2017 and 2018 would raise an additional \$16 billion. The remaining \$10 billion would be raised in subsequent equity offerings as the guarantors' capital needs increase. Five guarantors would thus be up and running by 2020.

Equity investors in the new guarantors would likely include those currently taking equity stakes in private mortgage insurers. Shareholders in the nation's largest PMI companies include mutual funds such as

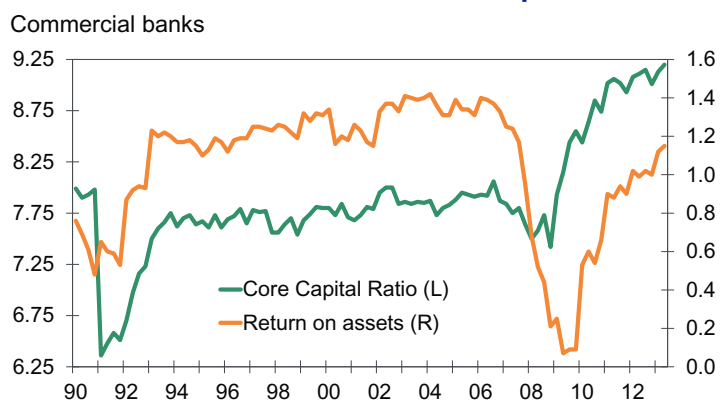
Fidelity and the Vanguard Group, pension funds such as TIAA-CREF, asset management firms such as Goldman Sachs Asset Management and State Street Global Advisors, hedge funds such as Paulson & Co. and Citadel, and diversified financial institutions such as BlackRock (see Table 2). A wide range of global reinsurers are also providing capital relief to the PMI companies and would likely be interested in taking stakes in the new guarantors.

Yet even if the guarantors can raise the amount of equity envisaged from public markets, a capital shortfall remains that grows from \$13 billion in 2016 to \$35 billion in 2020. This shortfall would be temporarily filled by the nation's large mortgage originators through a seller-financing arrangement. In the hybrid system assumed here, originators would not be permitted to own guarantors, but there would be an exception while the system is being established. In that period, originators would be required to temporarily

take equity in the guarantors in partial payment for the government-guaranteed mortgages they sell. The equity received by the originators as payment would be valued at 100% of tangible book value.

The success of requiring large originators to temporarily hold equity in the guarantors hinges on several factors. Most importantly, the originators, which include the nation's largest banks, would need to have excess capital. Capital ratios in the banking system are at a record high and rising: According to the Federal Deposit Insurance Corp., the Tier 1 capital ratio for all banks is above 9% and climbing (see Chart 4). Banks are also making record profits, and although their recent profitability is temporarily supported by

**Chart 4: Banks Will Have Excess Capital**



Sources: FDIC, Moody's Analytics

improving credit quality and the resulting release of loan loss reserves, they should have plenty of excess capital given their long-term earnings power and more limited growth opportunities post-regulatory reform.

While bank originators may object to this arrangement, they also have a strong incentive to ensure that the guarantors in the new hybrid system are well-capitalized. Originators will prefer a well-functioning housing finance system, with a government backstop and a to-be-announced market, to alternatives that require them to hold many more mortgages on their balance sheets. However, since the banks' investments in the guarantors would have pedestrian returns, and since a 100% risk-weighting would be capital-intensive, bank originators would be expected to sell their stakes in the guarantors as soon as their capital is no longer needed. There would also be a reasonable divestiture period, in case they are unexpectedly slow to sell their shares.

Critical to this arrangement's success is that even with their equity stakes, the large bank originators should have no control over the guarantors. Otherwise, small lenders would be appropriately nervous about their ability to compete. Large originators would receive nonvoting or B-shares as payment from the guarantors. This is similar to the arrangement Visa set up with its bank members when it designed its IPO. Once the B-shares were sold to non-originator investors, they would become voting A-shares.

### The future of Fannie and Freddie

A critical question in the transition to a future housing finance system is what to do with Fannie Mae and Freddie Mac. For all that is wrong with the current system, Fannie and Freddie are doing an effective job buying conforming mortgages, bundling them into MBS with a government guarantee, and selling them to global investors. The mortgage market is not working as well as it should, but it is working. Whatever is done with Fannie and Freddie must not disrupt this flow of mortgage credit, for the sake of the housing and economic recoveries.

Arguably the most straightforward approach, with the least amount of near-term

risk, would be to recapitalize and reprivatize Fannie and Freddie. Both are currently profitable, as a result of improving mortgage credit conditions and their higher guarantee fees. The two agencies' profits are flowing to the U.S. Treasury, rapidly offsetting the \$188 billion Fannie and Freddie received from taxpayers in order to stay in business. At last count they still owed \$42 billion but were on track to repay the Treasury's investment by early 2014.

After that, their profits could be used to build the capital necessary for them to become private guarantors in the future finance system. Once appropriately capitalized, they would be reprivatized, with the government selling them to private investors to maximize the return to taxpayers.

There is a considerable downside to this approach, however: The future housing finance system could again be dominated by Fannie and Freddie or their successors.<sup>17</sup> The system could encourage competition, for example, by establishing a new common securitization platform run as a government utility that produces a single government-backed security. The reincarnated Fannie and Freddie would also likely be classified systemically important financial institutions, or SIFIs, and thus face stiffer capital and liquidity requirements. This would raise their cost of capital vis-à-vis newer entrants, further supporting competition.

But the two giant firms would still have considerable advantages of size and scale, important legacy relationships, and entrenched software and systems. Most likely this approach would create a hybrid system dominated by a duopoly, firms with significant power over the mortgage and housing markets that would be much too big to fail. The arrangement would be uncomfortably similar to the dysfunctional system that prevailed prior to the Great Recession.

An alternative approach would be to simply put Fannie and Freddie into receivership and liquidate their assets. Guarantors in the hybrid system would be largely new entities, begun by those purchasing Fannie's and Freddie's assets. There is significant risk in this approach, as there would be no assurance that the new guarantors would be

able to continue the institutions' activities, at least not in a timely way. The chance of a disruption in the flow of mortgage credit would be uncomfortably high.

A better approach would be for the government to put Fannie and Freddie into receivership, and to strip them of their key assets. They would then be rechartered as new private guarantors, able to license back these assets from the government receiver. Their operations would not be disrupted, ensuring that the mortgage market functioned smoothly through the transition. But to level the competitive playing field, any other new guarantors could also license the same key assets from the receiver. This would facilitate easy entry into the guarantor market and thus competition.

The current Senior Preferred Stock Purchase Agreement between the U.S. Treasury and Fannie and Freddie would need to be restructured to permit the redemption of the Treasury's senior preferred shares and the cancellation of its warrant in the firms. The restructured SPSPA would determine the appropriate compensation taxpayers require from Fannie and Freddie for their financial support. Taxpayers should be made financially whole, receiving repayment for the support they provided to Fannie and Freddie, part of the cost of backstopping the rest of the housing market when they failed, and the cost of setting up a new financial system. Taxpayers should also require a return on their financial support commensurate with the risks they took.

Fannie and Freddie would be put into receivership, and their operating assets and liabilities moved into limited life regulated entities, or LLREs, allowing them to maintain their operations independent of the resolution process.<sup>18</sup> This is similar to the procedure envisaged in Dodd-Frank for failing SIFIs. The assets of the LLREs would then be sold or licensed back to Fannie's and Freddie's successor firms, which would be chartered as independent guarantors, and to the new competitor guarantors.

Fannie's and Freddie's \$4.5 trillion legacy guaranty book would not be included in the assets transferred from the government receiver to the LLREs. More private capital

would be needed to support the legacy books than could be raised in a reasonable period, ensuring that the new housing finance system would never get going. The receiver would engage the new guarantors to manage the loans in the legacy books, providing a steady source of revenue.

The impact on the federal budget of resolving Fannie and Freddie should be modest, although that depends somewhat on whether budget accounting from the Office of Management and Budget or the Congressional Budget Office is used. OMB treats Fannie and Freddie as private companies independent of the government, thus the impact on the federal budget is simply the net cash payments they make to the Treasury. OMB projects that Fannie and Freddie will remit just over \$50 billion to the Treasury over the next decade. CBO treats Fannie and Freddie as part of the federal government and uses fair-value accounting to calculate the cost of the net subsidy the government provides mortgage borrowers via the institutions. CBO projects that there will be a negative subsidy of about \$10 billion over the next decade.

### MBS guarantor market

The future housing finance system is expected to have five to 10 MBS guarantors. Five guarantors would ensure that the system is competitive and free from too-big-to-fail risk. Competition among guarantors would reduce interest rates on MBS and thus mortgage interest rates paid by homeowners. More than 10 guarantors could result in prohibitively high transaction costs. This is important for smaller MBS issuers grappling with the complexity of dealing with many guarantors and their different contracts, data exchange processes, and accounting and underwriting systems.

The MBS guarantor industry would exhibit significant economies of scale. Creating these scale economies is that a guarantor's risk declines as its portfolio increases in size and resembles the risk across all mortgage borrowers. Since the risks in mortgage lending are not independently distributed—the strong form of the law of large numbers does not hold—and significant losses can

occur—the mortgage loss distribution is fat-tailed—capital and regulatory costs are high. This favors larger guarantors. Larger guarantors can charge less for more marginal risks since they will have less of an impact on the risk of their entire larger portfolio. And informational asymmetries also advantage larger guarantors that are able to collect more and better data and information.

The scale economies could be reduced somewhat if the government guarantee is confined to QM loans, which seems likely. These loans are more homogenous and the risk premia on a guarantor's portfolio may converge more quickly to the population loss rate. Informational asymmetries could also be less significant if there is greater data transparency in the new housing finance system.

The scale economies in the MBS guarantor industry are expected to peak with guarantors that have close to a 20% share of the market. There may be one or two guarantors that cater to the most homogenous part of the mortgage market with a larger share, and several smaller guarantors that are more niche insurance providers. A guarantor established to cater to small mortgage originators as envisaged in a number of hybrid systems might be an example of a niche guarantor. For context, the five largest life insurance companies account for one-third of that market, while the top five property and casualty insurers account for almost half. The private mortgage insurance is more concentrated, particularly in the wake of the housing bust and the industry's consolidation, with the five largest PMI companies accounting for 85% of that market.

### Transition steps

A number of steps important to the transition process are already being taken, and should be encouraged. Most notable is the FHFA's effort to merge the securitization platforms of Fannie and Freddie. A common securitization platform will ultimately lead to a single, government-backed mortgage security to replace the current Fannie and Freddie securities. Fannie's and Freddie's recent efforts at risk-sharing with private investors will also support the transition by en-

couraging innovative ways to attract private capital to housing finance.

### Common securitization platform

In the hybrid system envisaged here, all government-guaranteed securities would use a common securitization platform. Although not required, nonguaranteed securities could use the same platform. The common securitization platform would produce a more liquid market, facilitate loan modifications in future downturns, and give issuers operating flexibility at a low cost. It would also allow for a robust TBA market.

The securitization facility would leverage current efforts by the FHFA to develop a single platform for Fannie Mae and Freddie Mac securities. For a fee, the securitization facility would provide a range of services, including mortgage loan note tracking, master servicing, data collection and validation to improve transparency and integrity, and bond administration.

Mortgage loans included in securities that use the common securitization facility (including all mortgages that benefit from the government guarantee plus some nonguaranteed loans) would be covered by a uniform pooling and servicing agreement and uniform servicing standards that encourage prudent underwriting and align investor and borrower interests. This would encourage the adoption of similar standards for other mortgages.

The common securitization platform would permit multiple originators to sell mortgages into single securities with access to the government guarantee. In return, the originators would receive pro rata shares of the security. Pooling requirements would be largely the same as for typical single-originator securities, and they would be good for delivery into the TBA market. Originators could thus easily convert securities to cash before the securities were created, an especially important feature for smaller originators.

### Single security

The common securitization platform would also promote development of a common government-guaranteed security, which



would improve liquidity in the TBA market and result in lower mortgage rates. A common security would also lower entry barriers into the guarantor market, as no guarantor would have an advantage because of the liquidity of the securities they back.

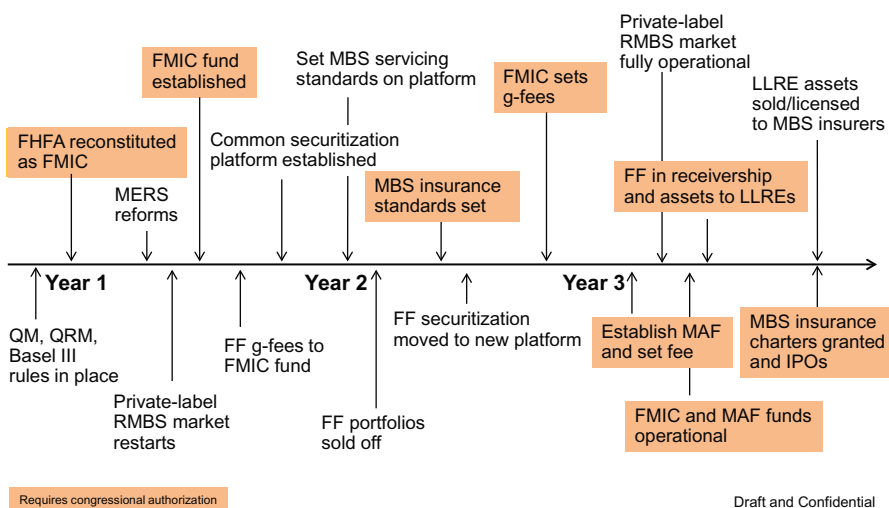
This is a problem in the current housing finance system, as Freddie Mac securities are much less liquid than Fannie Mae securities. Fannie and Freddie split the MBS market 60-40, but on a typical day the trading volume of Fannie MBS is 10 times greater than that of Freddie MBS. To compensate, Freddie is forced to charge a lower g-fee than Fannie. In the second quarter of 2013, Fannie's average g-fee was 57 basis points, compared with Freddie's 51 basis points. There are some modest differences in the securities—Freddie pays investors more quickly than Fannie and its securities prepay a bit more quickly—but the key difference is their liquidity. This liquidity difference makes the mortgage market less efficient and less competitive, and leads to higher costs for mortgage borrowers and taxpayers.

A potential near-term fix to this problem would be to make Fannie and Freddie securities fungible, creating a common TBA security.<sup>19</sup> That would require a change to the good-delivery guidelines for TBA, to allow the delivery of either Fannie or Freddie securities into the same contract. The securities themselves would not change; their separate TBA markets would simply be merged. Both securities would still be separately identifiable and tradable, only the TBA trades would be merged. Not only would this interim step improve liquidity, it would demonstrate investor interest in a truly common security that would be an important feature of the future hybrid housing finance system.

### Risk-sharing

Enticing private capital back into the housing finance system is part of the transition to any future housing finance system. It is thus encouraging that the FHFA has mandated Fannie and Freddie to begin that process. The goals are modest but substantive, and they motivate Fannie and Freddie to experiment creatively. Although

Chart 5: Housing Finance Reform Timeline



the pricing on these risk-sharing deals may not be economical, at least for now, what is learned from these efforts will be instrumental to ensuring there is enough private capital to support the future housing finance system.

Freddie recently issued Structured Agency Credit Risk, or STACR, securities, designed to offload the first-loss piece of certain guaranteed MBS into the private capital markets. The STACR's synthetic senior-subordinated floating-rate structure provides investors protection for prepayment and interest-rate risk.<sup>20</sup> Investor demand for the security was limited for a number of reasons—it was not rated and it has no risk-weighting—but it had a reasonably successful debut nonetheless. However, private investors will need more information to assess the relative value of STACR securities and alternative credit risk-sharing arrangements. This is necessary to scale up the effort and to better inform the debate on the future housing finance system.

Fannie also recently engaged in a risk-sharing transaction with NMI, a new private mortgage insurer. Offloading risk to the PMIs is worthy of experimentation, but this effort will also take time to scale up, since as much of the industry is still struggling to resolve its poor quality legacy books and uncertainty regarding future capital requirements.

### The road to reform<sup>21</sup>

The journey to housing finance reform has begun, but it will be long. Even after reform legislation is enacted, the process could take several years.

The principal steps on the road to reform are as follows (see Chart 5):

- » The Consumer Financial Protection Bureau has defined qualified mortgages, or QMs, and bank regulators have recently provided more clarity on the definition of qualified residential mortgages, or QRM. Basel III capital rules are also being ironed out.
- » These rules and others involving servicing and transparency are necessary before private capital will return and the transition to a new system can begin in earnest. The regulations could also significantly affect the extent of the government's backstop in the system. Mortgage loans comprising government-guaranteed MBS are expected to be QM and QRM.
- » Fannie Mae's and Freddie Mac's investment portfolios are steadily reduced per the FHFA's strategic plan.
- » Fannie and Freddie continue to scale up their risk-sharing efforts with private investors per the FHFA's strategic plan.

- » The government-run common securitization platform replaces Fannie's and Freddie's securitization platforms. The TBA market functions without interruption, as the Securities and Exchange Commission continues its exemption of Regulation AB for securities traded on the common securitization facility.
- » The Federal Mortgage Insurance Corp., an FDIC-like regulator of the housing finance system, is established, replacing the FHFA. Fannie's and Freddie's MBS are reinsured by the FMIC, fulfilling the government's commitment to existing MBS investors and stabilizing the housing finance system during the transition.
- » The FMIC formalizes the government guarantee for mortgage securities; establishes the Mortgage Insurance Fund; determines appropriate g-fees; sets the appropriate amount of private capital needed to protect the government's guarantee; determines standards for the capital adequacy of the new private MBS guarantors, private mortgage insurers, mortgage originators and servicers, MBS issuers, and other players in the housing finance system; and promulgates other necessary regulations.
- » The common securitization platform begins issuing a common government-backed security.
- » The FMIC implements reforms to the MERS mortgage registry.
- » A mechanism for collecting the Market Access Fund assessment on MBS is established. A governance structure is established for the Market Access Fund, and policies are developed to make awards from the fund, creating incentives for high-quality and sustainable affordable housing finance.
- » Fannie's and Freddie's charters are revoked, and the institutions are put into receivership. Some of their assets and liabilities are transferred to LLREs, while their legacy guarantee books remain with the government receiver.
- » The private-label securitization market steadily revives as the government's role recedes. Conditions necessary for the market to restart are already coming into place, most importantly being the newly established QRM rule. The government's reduced role in housing finance increases the attractiveness of nonguaranteed MBS.
- » Seller-servicer agreements between large mortgage originators and the LLREs are restructured so that originators receive cash and equity in compensation for their loan sales. This establishes a mechanism to ensure the new MBS guarantors have sufficient capital as their businesses grow.
- » Fannie's and Freddie's successor companies are rechartered and IPOs are held. New MBS guarantors are chartered and IPOs held. All of the guarantors are able to purchase or license assets from the LLREs. The Treasury ensures that this process maximizes taxpayer returns and that the private guarantor market is competitive.
- » Pre-conservatorship shareholders of Fannie and Freddie receive no value until the government is repaid in full. Although the government would likely maximize its recovery from selling Fannie and Freddie if those firms were allowed to again dominate the market, this would undermine the purpose of reform. The government can accept a smaller recovery on Fannie and Freddie in order to create a more competitive housing finance system, the paramount objective.
- » The government's role in the housing finance system is reduced over time as the required amount of first-loss private capital increases. Taxpayers' exposure is reduced in various ways, including lower conforming loan limits and the attachment point for losses borne by private capital. Unlike the old system in which no private capital stands ahead of taxpayers, the government's guarantee of MBS would be formalized so that government exposure would shrink.

## Conclusions

Since the government took over Fannie Mae and Freddie Mac during the financial collapse five years ago, effectively nationalizing the nation's housing finance system, nothing meaningful has changed. The government still backs nearly nine of every 10 U.S. mortgage loans. This is bad for both taxpayers and homebuyers.

Taxpayers are on the hook for potential losses on the hundreds of billions of dollars in mortgages that Fannie and Freddie insure each year. This is not necessary: Private investors are willing to take on much of this risk and, with some safeguards, are capable of doing it.

The longer Fannie and Freddie stay in government hands, the more lawmakers will be tempted to use them for purposes unrelated to housing. This has already happened. Last year's payroll tax holiday was partially paid for by raising the premiums Fannie and Freddie charge homebuyers for providing insurance.<sup>22</sup> Mortgage borrowers will be paying extra as a result over the next decade.

The housing market's revival has allowed Fannie and Freddie to again turn large profits, amounting to tens of billions of dollars each year. Policymakers may begin to rely on these profits to fund government spending, making it especially hard to let Fannie and Freddie go.

Policymakers may also eventually be tempted to make Fannie and Freddie lend to people who really cannot afford mortgages. Helping disadvantaged households become homeowners is laudable, but experience shows that politically driven help can be abused.

The bigger problem now is the limbo status of Fannie and Freddie, which fosters indecision at the two institutions and by their regulator, the Federal Housing Finance Agency. Lenders who do business with Fannie and Freddie are unsure of the rules, and are thus extra cautious, keeping credit overly tight for potential homebuyers. This is evident in the average credit scores of borrowers through Fannie and Freddie, which today are in the top third of all of credit scores.

Some in Congress recognize the current situation's dangers and have introduced

legislation to reform the nation's housing finance system. Yet these legislative efforts lack a clear plan for getting from the current housing finance system to the future one. The transition cannot be bungled: The nation's economic recovery depends on housing, which in turn depends on the flow of mortgage credit. The \$10 trillion U.S. mort-

gage market is also critically important to the entire global financial system.

Yet while the transition will be complicated and rife with risk, it is eminently doable, as the path presented in this paper illustrates.

The federal government has unwound much of its extraordinary intervention in the economy prompted by the Great Recession.

Fiscal stimulus has been replaced by fiscal austerity. The Trouble Asset Relief Program bailout fund will soon be history. The Federal Reserve is planning to begin normalizing monetary policy. That leaves Fannie and Freddie and the nation's housing finance system as the largest piece of unfinished business. It is time to finish it.

### Endnotes

- 1 This paper draws heavily on and builds upon the hybrid system presented in "A Pragmatic Plan for Housing Finance Reform," Ellen Seidman, Phil Swagel, Sarah Wartell, and Mark Zandi, Moody's Analytics, Milken Institute and Urban Institute white paper, July 19, 2013. This system is similar to that envisaged in Corker-Warner, albeit with some notable differences.
- 2 For a critical assessment of the Corker-Warner legislation, see "Evaluating Corker-Warner," Mark Zandi and Cris DeRitis, Moody's Analytics white paper, July 2013. The president's support for a hybrid system was expressed in a speech.
- 3 The three agencies are currently responsible for 85% of all purchase mortgage originations. The nation's banks originate the remaining 15%, which they hold on their balance sheets.
- 4 Loans eligible for a government guarantee would be qualified mortgages as currently defined by the Consumer Financial Protection Bureau.
- 5 If the MIF was depleted in a future crisis and the Treasury was required to provide financial support to the housing finance system, the FMIC would have the ability to raise guarantee fees on future mortgage borrowers to ensure that taxpayers are made whole.
- 6 The securitization facility would be used for all non-Ginnie Mae government-guaranteed securities and, although not required, could be used for nonguaranteed securities.
- 7 Market Access Fund and MBS insurer for small lenders.
- 8 According to the Mortgage Bankers' Association, during the five years between 2008 and 2012, single-family residential mortgage origination volumes averaged approximately \$1.75 trillion per year, of which \$1.2 trillion were refinancings. With equilibrium fixed mortgage rates of 6.5% well above the average coupon of approximately 5% on outstanding mortgage debt, future refinancing volume is expected to be closer to \$300 billion per year.
- 9 This is based on the assumption that 10-year Treasury yields will be close to annualized potential nominal GDP growth in the long run. Potential nominal GDP growth is expected to run between 4.5% and 5%, equal to 2% inflation and real GDP growth of 2.5% to 3%. Thirty-year fixed mortgage rates are expected to be approximately 175 basis points over 10-year Treasury yields.
- 10 The majority of home sales to investors are for cash, while most sales to first-time homebuyers are financed with mortgages.
- 11 This represents the option-adjusted spread on Fannie Mae 30-year current coupon securities.
- 12 The protection to taxpayers is 12.5%. This includes 10% in private capital and 2.5% in the mortgage insurance fund. In other words, losses on mortgage securities backed by the government would have to be greater than 12.5% before taxpayers would be called upon to support the system. To produce losses of this amount, a financial crisis would have to be almost three times as severe as the Great Recession.
- 13 This concern is expressed well by Peter Wallison in a July 1, 2013 Wall Street Journal op-ed, "The Corker-Warner Housing Finance Reform Won't Work." <http://online.wsj.com/article/SB10001424127887323873904578569820608849816.html>
- 14 The losses through 2012 are less than 5%, but foreclosures are still high and thus more losses are coming.
- 15 These mortgage rate impacts are based on a guarantee fee calculator that determines through a net-present-value computation of cash flows the fee necessary to meet conditions for both solvency and return on equity. The calculator is available upon request.
- 16 This assumes that single-family mortgage debt runs off by 10% per year as a result of prepayments and normal amortization. Multifamily debt is assumed to run off by 2% per year.
- 17 This would be an even greater risk if, as in some proposed hybrid systems, they would also be permitted to originate mortgage loans.
- 18 The LLRE is established under the Housing and Economic Recovery Act of 2008. <http://www.gpo.gov/fdsys/pkg/PLAW-110publ289/html/PLAW-110publ289.htm> HERA gives the FHFA authority to transfer of Fannie's and Freddie's assets to a LLRE to facilitate their orderly liquidation.
- 19 A thorough discussion of a proposal to create a fungible Fannie-Freddie security is provided in an MBA working paper "Ensuring Liquidity Through a Common, Fungible GSE Security." <http://www.mbaa.org/files/Advocacy/2013SingleSecurityConcept-Transition1.pdf>
- 20 It is a synthetic security, in that it references a pool of recently originated mortgages although it is not a credit-linked note. A CLN is a more intuitive structure, but since it is a derivative it would have to satisfy a range of other regulatory requirements. The STACR structure avoids these regulatory issues.
- 21 To fully understand the steps on the road to reform, it is necessary to understand the hybrid system assumed in this white paper. The system is described in detail in "A Pragmatic Plan for Housing Finance Reform," Seidman, Swagel, Wartell and Zandi.
- 22 Fannie and Freddie guarantee fees were increased by 10 basis points for 10 years to help pay for the payroll tax holiday. This will raise more than \$20 billion for the federal government over the next decade.

# About the Author

## Mark Zandi

Mark M. Zandi is chief economist of Moody's Analytics, where he directs economic research. Moody's Analytics, a subsidiary of Moody's Corp., is a leading provider of economic research, data and analytical tools. Dr. Zandi is a cofounder of Economy.com, which Moody's purchased in 2005.

Dr. Zandi's broad research interests encompass macroeconomics, financial markets and public policy. His recent research has focused on mortgage finance reform and the determinants of mortgage foreclosure and personal bankruptcy. He has analyzed the economic impact of various tax and government spending policies and assessed the appropriate monetary policy response to bubbles in asset markets.

A trusted adviser to policymakers and an influential source of economic analysis for businesses, journalists and the public, Dr. Zandi frequently testifies before Congress on topics including the economic outlook, the nation's daunting fiscal challenges, the merits of fiscal stimulus, financial regulatory reform, and foreclosure mitigation.

Dr. Zandi conducts regular briefings on the economy for corporate boards, trade associations and policymakers at all levels. He is on the board of directors of MGIC, the nation's largest private mortgage insurance company, and The Reinvestment Fund, a large CDFI that makes investments in disadvantaged neighborhoods. He is often quoted in national and global publications and interviewed by major news media outlets, and is a frequent guest on CNBC, NPR, Meet the Press, CNN, and various other national networks and news programs.

Dr. Zandi is the author of *Paying the Price: Ending the Great Recession and Beginning a New American Century*, which provides an assessment of the monetary and fiscal policy response to the Great Recession. His other book, *Financial Shock: A 360° Look at the Subprime Mortgage Implosion*, and *How to Avoid the Next Financial Crisis*, is described by the New York Times as the "clearest guide" to the financial crisis.

Dr. Zandi earned his B.S. from the Wharton School at the University of Pennsylvania and his PhD at the University of Pennsylvania. He lives with his wife and three children in the suburbs of Philadelphia.

## Cristian deRitis

Cristian deRitis is a director in the Credit Analytics group at Moody's Analytics, where he develops probability of default, loss given default, and loss forecasting models for firms and industries; contributes to forecasts and analysis for CreditForecast.com; and writes periodic summaries of the consumer credit industry. His commentary on housing and mortgage markets, securitization, and financial regulatory reform often appears on the Dismal Scientist web site and in the Regional Financial Review.

Dr. deRitis' recent consulting work has included an evaluation of the efficacy and cost of the federal government's Home Affordable Modification Plan, and he is frequently consulted on credit risk modeling and measurement as well as housing policy. He helped develop the company's models to forecast the Case-Shiller and FHFA metropolitan house price indices and is a regular contributor to the firm's Housing Market Monitor. Dr. deRitis also gives frequent presentations and interviews on the state of the U.S. housing, mortgage and credit markets.

In his previous work at Fannie Mae, Dr. deRitis supervised a team of economists who developed models of borrower default and prepayment behavior. He has published research on consumer credit and credit modeling as well as on the costs and benefits of community mediation. He received a PhD in economics from Johns Hopkins University, where he focused on the impact of technology on labor markets and income inequality. His bachelor's degree in economics is from the Honors College at Michigan State University.



# About Moody's Analytics

## Economic & Consumer Credit Analytics

Moody's Analytics helps capital markets and credit risk management professionals worldwide respond to an evolving marketplace with confidence. Through its team of economists, Moody's Analytics is a leading independent provider of data, analysis, modeling and forecasts on national and regional economies, financial markets, and credit risk.

Moody's Analytics tracks and analyzes trends in consumer credit and spending, output and income, mortgage activity, population, central bank behavior, and prices. Our customized models, concise and timely reports, and one of the largest assembled financial, economic and demographic databases support firms and policymakers in strategic planning, product and sales forecasting, credit risk and sensitivity management, and investment research. Our customers include multinational corporations, governments at all levels, central banks and financial regulators, retailers, mutual funds, financial institutions, utilities, residential and commercial real estate firms, insurance companies, and professional investors.

Our web periodicals and special publications cover every U.S. state and metropolitan area; countries throughout Europe, Asia and the Americas; the world's major cities; and the U.S. housing market and other industries. From our offices in the U.S., the United Kingdom, the Czech Republic and Australia, we provide up-to-the-minute reporting and analysis on the world's major economies.

Moody's Analytics added Economy.com to its portfolio in 2005. Now called Economic & Consumer Credit Analytics, this arm is based in West Chester PA, a suburb of Philadelphia, with offices in London, Prague and Sydney. More information is available at [www.economy.com](http://www.economy.com).

---

© 2013, Moody's Analytics, Inc. and/or its licensors and affiliates (together, "Moody's"). All rights reserved. ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT. All information contained herein is obtained by Moody's from sources believed by it to be accurate and reliable. Because of the possibility of human and mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. Under no circumstances shall Moody's have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of Moody's or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if Moody's is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The financial reporting, analysis, projections, observations, and other information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell, or hold any securities. NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER. Each opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation prior to investing.

## CONTACT US

For further information contact us at a location below:

### U.S./CANADA

+1.866.275.3266

### EMEA

+44.20.7772.5454 London  
+420.224.222.929 Prague

### ASIA/PACIFIC

+852.3551.3077

### OTHER LOCATIONS

+1.610.235.5299

Email us: [help@economy.com](mailto:help@economy.com)  
Or visit us: [www.economy.com](http://www.economy.com)

Copyright © 2013, Moody's Analytics, Inc. All Rights Reserved.